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THE BRITISH AMATEUR TELEVISION CLUB

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APOLOGY TO B.A.T.C. MEMBERS

I must offer sincere apologies to all Club Members for the long delay in producing this edition of CQ-TV. The combined effect of work and other difficulties, caused through absence abroad, has effectively denied any spare time till recently. A new disaster then occurred, when the original draft of this edition got lost in the post. This is an emergency issue, produced at very short notice. Any material which is missing will be included in the next edition of CQ-TV.

Many thanks are due to John Lawrence for the excellent articles he has produced, which, with one exception, is the sum total of all the technical articles received this year. Please give your support by submitting articles for publication via the General Secretary. Anything is welcome!

THE EDITOR

COVER PICTURE

F9MF Tranquille Fabris with his creepy-peepy vidicon and transmitter outfit drinks a toast at the reception given for delegates to the International A.T.V. Convention in the Town Hall at Armentieres.

ARMENTIÈRES CONVENTION

An International Congress of Amateur Television organised by the Club Francoise de Télévision d'Amateur was held on Saturday 19th and Sunday 20th April in the Salle des Sports at Armentières in Northern France. This highly successful event was attended by over 300 Amateurs from France, Belgium, W. Germany, Switzerland, the United Kingdom and other countries.

The programme comprised, 1. A technical conference in which the State of amateur TV activity in various countries was described, and papers read on a number of technical aspects. 2. An exhibition of amateur television equipment and photographs from several countries. 3. An exhibition of historic radio and television equipment.

A working amateur Television Station under the call F9MF/T maintained a two way Vision and Sound QSO on 70 cm with ON4 RT/T a Station specially set up by the Belgian ATA at Mont Rouge in that country.

On the Saturday evening the proceedings were enlivened by a dance at which was held an election for "Miss Amateur Television", and on the Sunday the delegates were received by the Major and Civic Leaders in the Town Hall.

The programme closed with a Banquet and a draw for prizes.

Talk in for mobiles was provided during the period of the Congress by Stations on 3.5 and 144 MHz operated under the Call Signs F8REF and FØ TV.

The highlights of the exhibition were; a 70 cm TV TX, Vidicon Camera and a slide scanner exhibited by F9 MF of Pevronne. Similar items were also shown by F9DF of Bordeaux, F3DD of Paris, F5TY of Oreil and F1ABA, F2AC and F5AN.

West Germany was represented by DLØAK and DLØKT of Cologne and DJ8DW-TV who showed a 70 cm Transmitter and a very neatly constructed Vidicon Camera.

The Swiss Groupment Experimental D'Emmissions TV d'Amateur of Geneva projected films illustrating their highly professional station HEITA and contacts which they had had with F5DN Annermasse, and F5DN/P on the Jura mountains.

The United Kingdom was represented by 15 delegates including: G6 AEC/T who exhibited a working experimental unijunction counter. GW6FDZ/T (WB8WJ/T) showing a working 405/625 Line Sync Generator built from integrated circuits. GW6JGA/T showing a working vision mixing unit and electronic pattern generator 96LEE/T, a working vidicon solid state camera chain. G6KKD/T his 70 cm Vision and Sound combining unit and G6RSA/T a 70 cm 4 x 150A PA stage and G6OUO/T was also present.

Congratulations are due to F3DD (the President of the CFTA) for organising this first venture in such an excellent manner.

SEE CENTRE PAGE FOR PHOTOGRAPH !

SUBSCRIPTIONS

In view of the lack of CQ-TV editions produced this year, the Committee have agreed to waive subscriptions for 1970 for all members who joined before 1st July, 1969. Repayment will be made on all Bankers Orders. Please note all subscription renewals should be sent to the General Secretary.

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A SIMPLE SYNC PULSE GENERATOR

by G6JGA/T

Introduction.

In any Amateur T.V. set-up the heart of the system is the sync pulse generator. This unit provides pulses, to lock the time-bases of the camera, flying-spot scanner or other picture source, and mixed blanking and synchronising pulses which are combined with the video signal in the processing unit to provide a composite video output. The experimenter who is just starting with amateur T.V. may feel that a full-scale sync pulse generator, to U.K. standards, is rather more than he wants to tackle. The Simple Sync Pulse Generator to be described, whilst not conforming to the full waveform specification, is simple to build and get working, and will provide a satisfactory source of pulses for driving the usual range of amateur T.V. equipment. The total cost, using all new components, is about £5.

The S.P.G. generates mixed syncs, mixed blanking, line drive and field drive, all at 2 volts p-p into 75 ohms. If the line and field drive are not required, these circuits may be omitted with a consequent slight saving in cost. The line frequency, sync, blanking and drive may be set for 405 or 625 line standard by selecting the appropriate value of capacitors in the timing circuits. The field oscillator may be free-running, or if desired, locked to the mains frequency. High level outputs of line sync, mixed blanking and mixed syncs are available for driving a video processing unit, to be sited adjacent to the S.P.G. This unit will be described in a subsequent article.

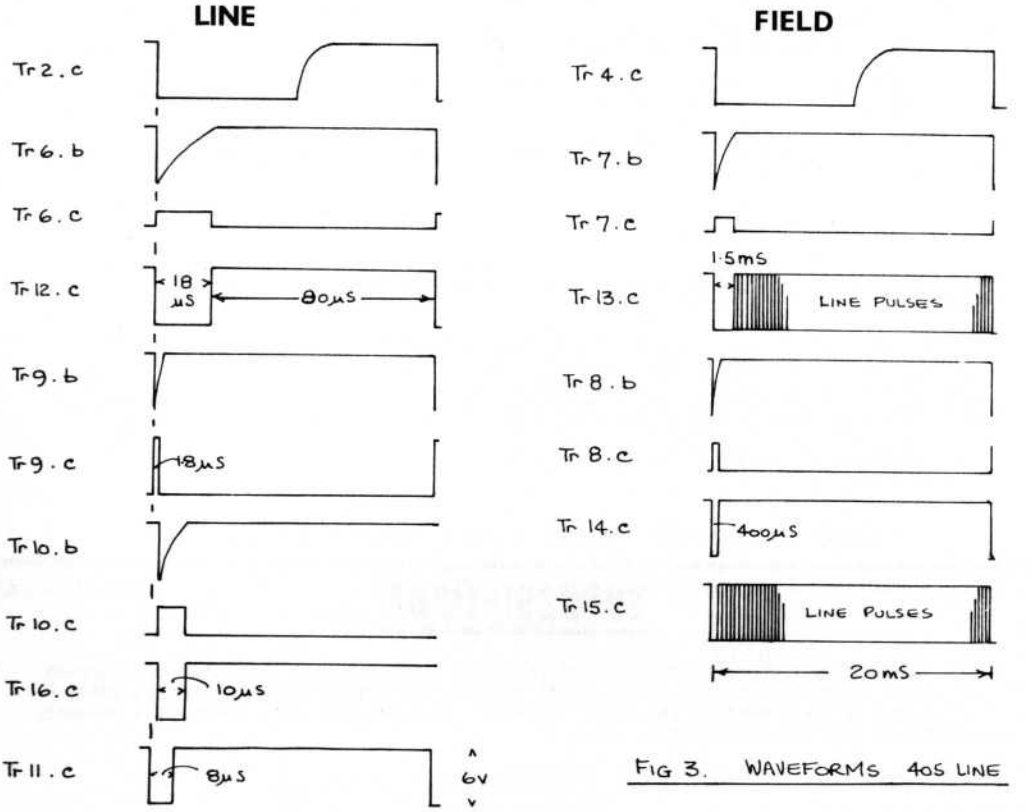


FIG 3. WAVEFORMS 405 LINE

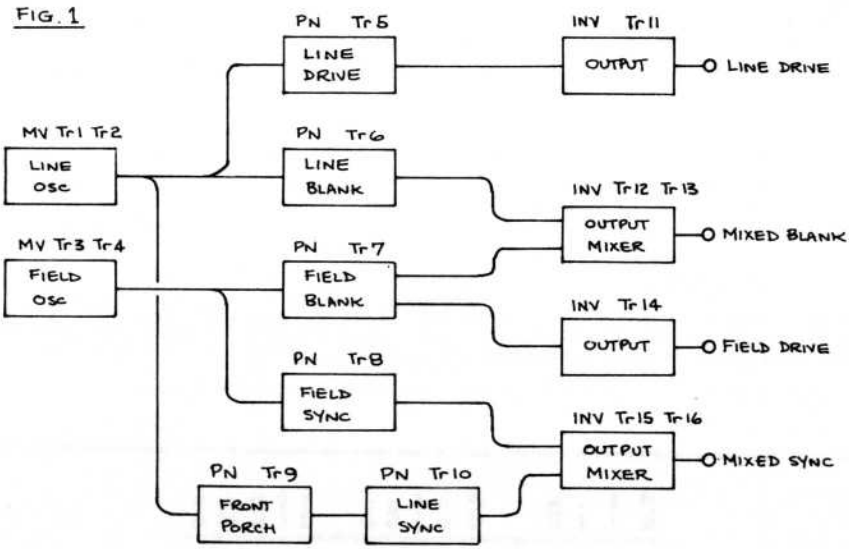
Circuit Description.

A block diagram of the S.P.G. is shown in Fig. 1. The complete circuit is made up from three basic types of circuit, a multivibrator, a pulse narrower and an inverter output stage. The complete circuit is shown in Fig. 2. To describe the operation of each type of circuit, it is convenient to consider the field oscillator, field blanking and the associated output stage. The field oscillator consists of Tr3 and Tr4 coupled in a standard multivibrator circuit. The frequency is determined by the time constants of the coupling capacitors and the base resistors. One of the two resistors on Tr3 base is variable so that the frequency may be set exactly to 50 Hz. The multivibrator can be locked to the mains frequency by connecting 6.3 volts a.c. between the free end of the 10k ohm resistor and the 0 volt line. The waveform from the multivibrator is shown in Fig. 3. (Tr4 collector).

The pulse narrower circuit generates a positive going pulse of shorter duration than the negative pulse driving it. The negative going waveform from Tr4 collector drives the base of Tr7 negative, thus cutting off Tr7. The base resistor then discharges the coupling capacitor exponentially towards the positive line until Tr7 base becomes positive, causing Tr7 to turn on again. The duration of the resultant positive going pulse, at the collector of Tr7, is determined by the time constant of the coupling capacitor and the base resistor. $t = 0.7\ CR$. (For a base resistor of 150k ohms the value of the associated capacitor is approximately 10 picofarads per microsecond or 10 nanofarads per millisecond and for 15k ohms, 100pF per microsecond). The coupling capacitor is recharged when the multivibrator output goes positive. The positive going pulse at the collector of the pulse narrower is fed to the output stage inverter, Tr13. This stage provides a negative going pulse output of 2 volts p-p into 75 ohms, the open circuit output is about 5.5 volts.

Where two waveforms are to be combined, for example, line and field blanking to form mixed blanking the line waveform is fed to Tr12 and the field waveform to Tr13, the waveforms then combine in the common collector load resistor. Where a pulse narrower has to feed two invertors, as in the case of Tr8 feeding Tr14 and Tr15, the signal is fed through two 3k3 ohm isolating resistors, to ensure equal base drive current to both inverters. The waveforms present at various points in the circuit are shown in Fig. 3.

FIG. 1



MV - MULTIVIBRATOR. PN - PULSE NARROWER. INV - INVERTOR.

over →

Construction.

A convenient method of construction is to build the circuits on Lektrokit (perforated paxolin-type) panels, and mount the components on Lektrokit taper pins.

Alternatively standard group boards may be used. The capacitors below 1 nanofarad (.001 microfarad) should be close tolerance 1 or 2% silvered mica. Those above 1 nanofarad, excluding the electrolytic should be good quality polyester or similar, ± 20% or preferably 10%. All the resistors should be high stability 5%, 1 or ½ watt types. The extra expense of using close tolerance components is offset by the absence of pre-set pots. The Texas 2N3710 transistor has been chosen for having a rating of Vce -6v and hFE in the range 90 - 330. Circuit operation may be affected if different types are substituted. The Texas 2N3704 transistor has been chosen for having a rating of Ic in excess of 100 mA, and hFE in excess of 100 and a high fT (100 MHz). Substitution of other types may be made here but the ratings should be similar.

Setting Up.

Assuming there are no faults, the line and field frequency controls may be set by feeding mixed sync from the S.P.G. into a monitor receiver, which has previously been set to operate correctly on a broadcast transmission. The controls should be set so that a locked raster is obtained. The 6.3 volt mains-lock supply should be temporarily disconnected whilst this is being done.

If any faults are present, these may be located using an oscilloscope and comparing the observed waveforms with those in Fig. 3.

Performance.

	405	625
Line frequency	10, 125 Hz	15,625 Hz
Line blanking pulse	18 micros.	12 micros.
Front porch	1.8 "	1.5 "
Line sync pulse	10 "	4.7 "
Field blanking pulse	1.5 millis.	1.5 millis.
Field sync pulse	0.4 "	0.4 "

Accuracy is dependant on component tolerances.

Notes.

A simple video processing unit, previously mentioned, connects to X, Y and Z.

The 2N3710 and 2N3704 are available from Quarndon Electronics Ltd., Slack Lane, Derby, at 2/5d and 3/6d each respectively for quantities of 1 - 24. (Feb. 1969). There is a minimum order charge of 30/- in operation, so be sure to order more than 30/- worth on any one order!

Lektrokit panels LK141 and Pins LK3011 are available from Home Radio of Mitcham.

Club Sales Items

	£. s.d.
Vidicon yokes for transistor circuitry	£6.10.0. (pp U.K.)
Paxolin vivicon base	3.0.
Second grade separate mesh vidicons	£10. 0.0.
Monoscope tubes (pot luck - no choice of pattern)	£7. 0.0.
"C" mount lens flanges	8.6.

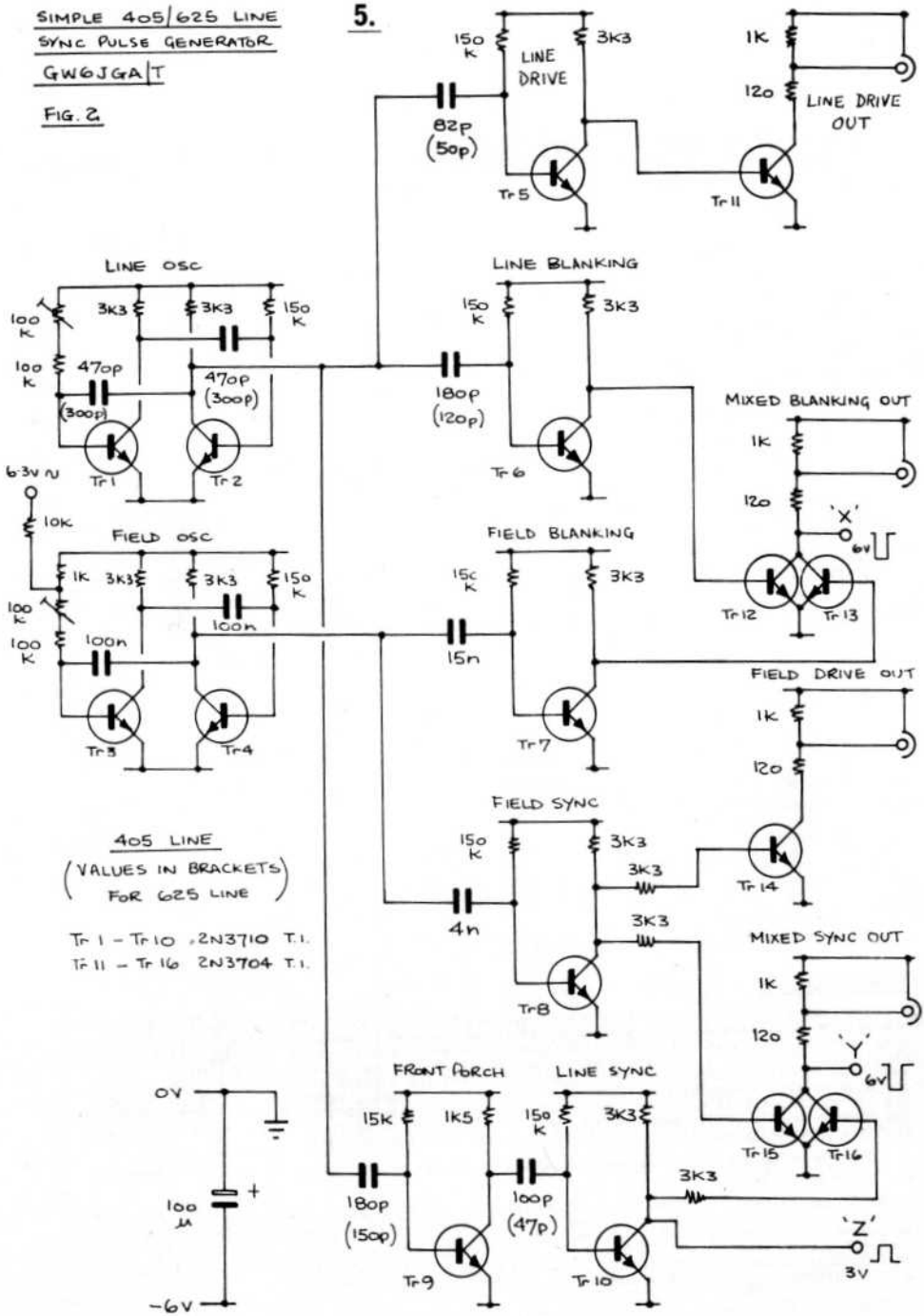
	s.d.	
BATC lapel badges	3.6.	
BATC lapel badges with Call Sign (del. 6-10 weeks)	5.6.	
BATC stick-on silver/black emblems	1.0.	
Notepaper and envelopes	15.0.	per 100 sheets.
35mm filmstrip of 10 editions of CQ-TV	15.0.	

Order via: C.G.Dixon, Kyrles Cross, Peterstow, Ross-on-Wye, Herefordshire.

SIMPLE 405/625 LINE SYNC PULSE GENERATOR

GW6JGA|T

FIG. 2.



A SIMPLE VIDEO PROCESSING UNIT

By J.T. Lawrence GW6JGA/T

The processing unit to be described is intended to work with the Simple Sync Pulse Generator.

It is normal for the video signal generated by a flying-spot scanner, camera or other picture source to consist of a positive going video signal, with suppression of the video during the line and field blanking periods.

To make this signal into a composite video signal, which is suitable for viewing on a normal monitor and for feeding to the vision transmitter, it is first necessary for it to be processed. This entails inserting blanking and sync signals of the correct timing, duration and amplitude relative to the video component. As the time-bases of the picture source will be driven from the sync pulse generator, it follows that the blanking and sync signals will therefore be timed for insertion at the correct part of the video waveform.

The controls in the processing unit enable the relative amplitudes of the various signals to be adjusted to give the correct proportions to the composite video signal.

A block diagram showing the various parts of the circuit is given in Fig. 1. The complete circuit is shown in Fig. 2.

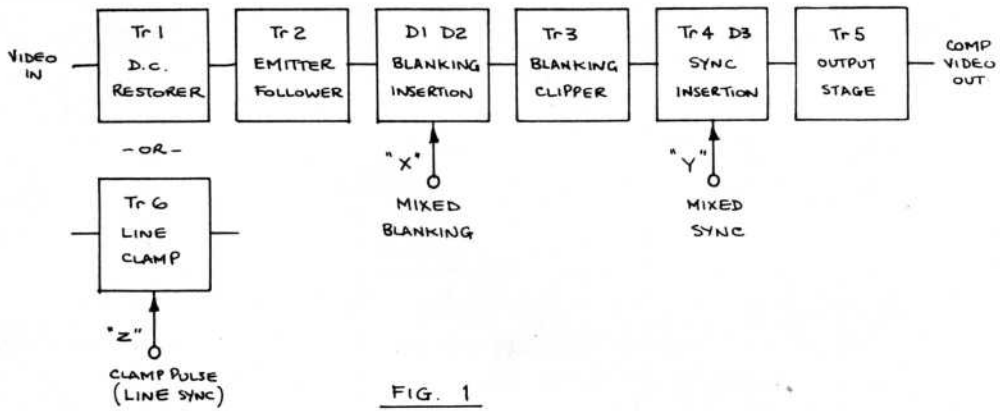


FIG. 1

Circuit Operation

Input video signals across RV1 are a.c. coupled via C2 to the emitter of Tr1. Tr1 emitter conducts on the negative-going excursions of the video signal, thus restoring the d.c. component. The d.c. level is set by RV2. The d.c. restored signal is passed to the emitter follower stage, Tr2, which has a high input and a low output impedance. Mixed blanking input is at -6 volts, D2 is non-conducting and the video signal from the emitter of Tr2 passes through D1 to the base of Tr3. When the mixed blanking input is at -6 volts, (during the blanking period) the current through R6 switches from D1 to D2 and D1 becomes non-conducting, thus blanking off the video signal to Tr3. Leaving Tr3 for a moment, the base of Tr4 is taken to a reference voltage, (nominally -3.4v) provided by the potential divider R9, R10.

Negative-going mixed sync is superimposed on this reference voltage and can be adjusted in amplitude by RV 3.

Returning to Tr3, the video signal with large blanking pulses is fed to the base, and when this video signal is more positive than the reference voltage, Tr3 conducts and blanked video is present at the emitters of Tr3, Tr4. When the blanking makes the video signal more negative than the reference voltage, Tr3 cuts off and Tr4 turns on, providing mixed sync at the emitters of Tr3, Tr4. This composite video signal is fed to Tr5, the emitter follower output stage, which provides a composite video output of 1 volt p-p into 75 ohms.

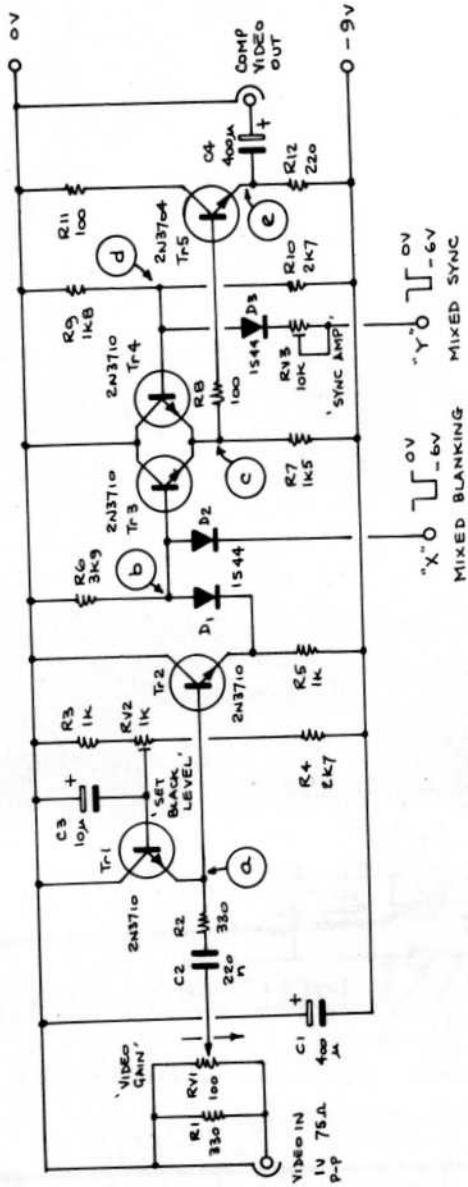


FIG. 2. VIDEO PROCESSING UNIT

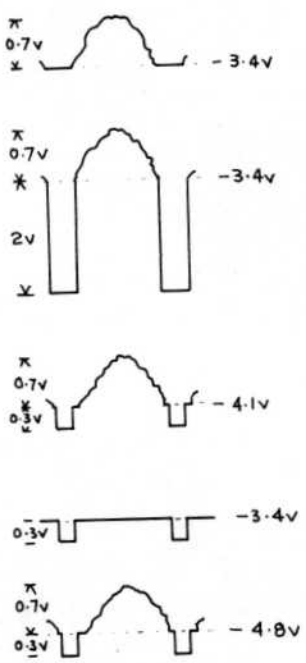


FIG. 4

OVER →

Input Line Clamp

The d.c. restorer is quite satisfactory for fairly 'clean' input signals, but for input signals containing a large proportion of mains hum or low frequency tilt the d.c. restorer may not operate satisfactorily due to the input time constants and a line clamp may provide better results.

The circuit for a suitable line clamp is shown in Fig. 3.

Circuit Operation

Input Signals across RV1 are a.c. coupled via C2 to the collector of Tr6 and the base of Tr2.

Tr6 is non-conducting during the picture period but is turned hard on for a short time during the blanking period. This effectively clamps the voltage of Tr6 collector and Tr2 base to the potential set by RV2. As this is done at the start of each line, it removes any unwanted low frequency tilt in the video signal.

Positive-going pulses, required at the base of Tr6, are a.c. coupled by C5 and provided by the sync pulse generator from point "Z". The pulses are in fact positive-going line sync pulses of about 3 volts p-p. R14 provides a small current which approximately compensates for the base current of Tr2. The optimum value depends on the beta of Tr2 and the value, 220 kohms, may be reduced down to 100k if excessive line tilt is noticeable.

The point "X", "Y", "Z" should be connected directly to these points on the sync pulse generator, using short leads. It is essential that the 0 volt line is common to both units.

Setting Up

Assuming that there are no faults, the setting up of the processing unit should present no problems. Connect a 75 ohm termination to the output socket and connect an oscilloscope across this termination. Set the 'Video Gain' to minimum and the 'Set Black Level' to the negative end of its rotation. Adjust RV3 for a mixed sync pulse amplitude of 0.3 volts p-p. Adjust RV2, the 'Set Black Level', so that the blanking pulse is just visible, giving a pedestal of about 10% of the sync amplitude. Feed in a suitable video signal to the video input, (if a line clamp is in use, the video signal must be blanked at line frequency) and adjust RV1, the 'Video Gain' control, to give a total output signal of 1 volt p-p. If necessary, re-adjust RV2 and RV1 to give a correct composite video signal. Waveforms at various parts of the circuit are shown in Fig. 4.

Acknowledgement

The circuit of this processing unit is adapted from a design by D. Mann and J. Tanner.

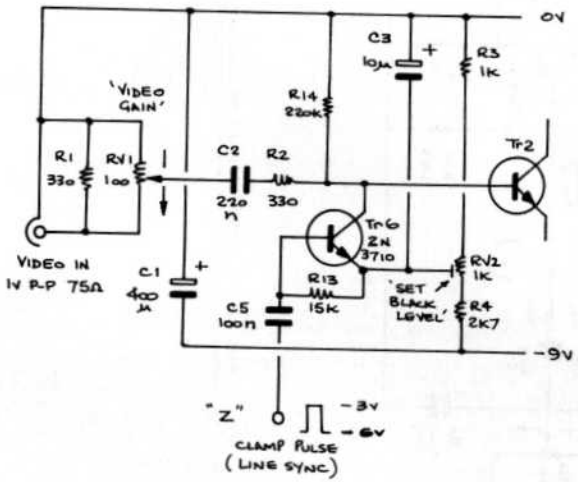


FIG. 3 VIDEO PROCESSING UNIT, INPUT LINE CLAMP

Miss Amateur Television!

nes découvrent ision d'amateurs

nche, ils tiennent congres à Armentières

urs a évi- Six bonts nter- que , les leur sont et lans apti- ssa- noré ision n'a, ci à

l'intérieur de l'hexagone, que sept licences à des pratiquants de la télévision d'amateurs.

Ce chiffre schématise à l'excès une situation en pleine évolution. Ils sont beaucoup plus nombreux à s'intéresser au tube cathodique et à chercher à accroître la puissance de leur récepteur. Car le porteur d'une licence anime habituellem[…] club ou un groupe […] d'amateurs. Le[…] techniques […] coût du […] à […]

plupart la région parisienne. Ils se regroupent principalement autour du club français de télévision d'amateurs (18, rue de Bellevue, Paris-19e) et du Radio-Club de Boulogne-sur-Seine. Ils ont cependant acquis une notoriété suffisante auprès des autres pays. L'un d'eux vient d'établir une première liaison France-États-Unis. Ils espèrent montrer […]ur dynamisme en organisant à […]mentières (Nord) le Congrès […]rnational de télévision d'ama[…]r.

[…]edi et dimanche, ils […]ront dans la cité de la […]e 160 représentants des […]rangers. La B.B.C. atta[…] d'importance à cette […] internationale […] puis […]ffusera sur le réseau […]sion les transmissions […]les qui auront lieu […]sion entre la France […] Belgique. France-Inter, […]our sa part, donnera des […] de la manifestation.

[…]ent-ils de ce congrès ? […] qu'ils ont beau[…] […]ndre des pays où […]es de télévision et […] sont plus dévelop[…] les activités d'ama[…] plus favorisées. Aux […]u Japon, des program[…]iers sont réalisés par […]teurs. Ils n'en sont pas […]

[…]us ne sommes autorisés, […]ils, qu'à fabriquer des mi[…] à transmettre des messa[…] On nous accorde, d'autre […] une puissance de 100 watts, […]s qu'en Allemagne elle est […] 750 et aux États-Unis de […]000. Nous surprenons toujours […]s étrangers lorsque nous leur […]lisons qu'on nous accorde des licences pour quarante-huit heures seulement. »

Ils espèrent apporter la démonstration du sérieux de leurs travaux et convaincre de la qualité des loisirs qu'ils proposent aux jeunes.

Robert-G. Challon.

FIGARO 17 AVRIL 1969

[…]ES RADIO-AMATEURS

[…]ura lieu les 19 et 20 avril le congrès […] la radio et de la télévision d'amateurs. […] participants viendront d'Angleterre, de […] de Belgique, de Hollande, du Portugal, etc. – […]eurs français affiliés au club français d'ama[…]

[…]positions de maté[…] […]e rétrospectif […]ences techni[…] […]nationales.

[…] prévoit notamment d[…] […] direct du mont Ke[…] […]sion, le rallye radio[…] […] par les présidents […]

L'AURORE 16 avril 1969

CONGRES INTERNATIONAL DE LA TELEVISION D'AMATEUR ARMENTIERES LES 19 ET 20 AVRIL 1969

LE Club Français de Télévision d'Amateur, C.F.T.A., organise avec la collaboration de la section R.E.F. du Nord, et avec le concours des clubs nationaux étrangers de TV amateur, un congrès international de la télévision d'amateur qui se tiendra à Armentières, les 19 et 20 avril 1969.

Ce congrès est préparé et organisé avec la collaboration du Réseau des Emetteurs Français, section du Nord et avec la participation des principaux clubs français et étrangers (France DX TV Club, B.A.T.C. Anglais, A.T.A. Belges, HEITA Suisses, etc.).

Les buts à obtenir sont : 1° le développement des réseaux de TV amateur en France ; 2° l'obtention des licences définitives pour tous les OM équipés en émission de TV, montrer aux différentes administrations intéressées ainsi qu'au public ce qu'est la TV/OM ; 3° la coordination des travaux entre ces amateurs.

CONVENTION 1970

CHURCHILL COLLEGE

CAMBRIDGE 24-26 JULY

Details in Next CQ-TV!

MANCHESTER MINI CONVENTION

On Saturday, 20th September, a small but successful gathering was held at the Granada TV studio centre in Manchester, organised by Gordon Sharpley G6LEE-T and Tony Jacques G6ACW-T. About thirty members attended during the day. There was a small display of equipment and publications, tea and biscuits and the usual good old natter with circuits on the backs of envelopes etc. A few members made a tour of the technical facilities of the Granada TV station.

It is unfortunate that the non-publication f CQ-TV did not permit word of this meeting reaching many members who could have gone along. It is hoped to repeat the event in the alternate years between the main club convention.

circuit notebook – 'MIXED SYNCS'
NO 1

Pulse Narrowers.

The pulse narrower is a simple circuit which generates a pulse of shorter duration than the pulse driving it. It is capable of giving excellent results and only requires the minimum of components. The basic circuit is shown in Fig. 1.

Circuit Operation.

With no input signal the current through R2 is sufficient to saturate Tr1. The base is at +0.6 v. and the collector is almost at 0 v. Point 'a' is at +6 v. and C1 is charged to 5.4 v.

A negative-going pulse from the previous stage is passed to Tr1 base via C1 so that 'b' is at -5.4 v. Tr1 is now cut off and the collector 'c' rises to +6 v. The current through R2 discharges C1 exponentially towards the +6 v. line, the speed is dependant on the time constant of C1 and R2. This continues until the voltage on Tr1 base becomes positive, Tr1 then conducts causing the voltage at 'c' to return to 0 v. When the input pulse finishes, 'a' returns to +6 v. at a rate determined by R1 and C1. The duration of the output pulse is approximately equal to 0.7 C1 R2.

It is important that the beta of Tr1 is greater than $\frac{R2}{R3}$ or Tr1 will not saturate properly.

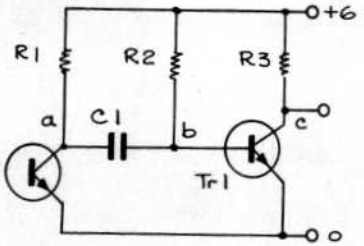


Fig 1.

Application.

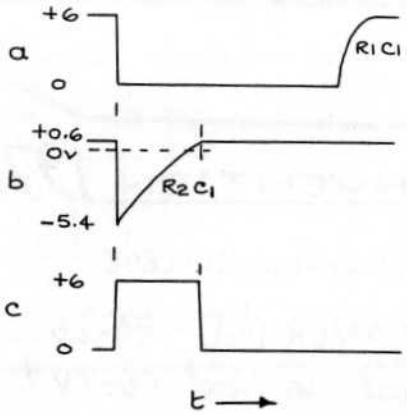
405 Line Front Porch and Line Sync Pulse Generator.

The circuit is shown in Fig. 2 and the waveforms in Fig. 3. The initial condition, with no signal input is as follows:

a	+6	Volts	Tr1	on
b	+0.6	"	Tr2	on
c	0	"	Tr3	off
d	+0.6	"		
e	0	"		
f	+6	"		

A 6 volt negative-going pulse appears at 'a' (start of line blanking), 'b' goes to -5.4 v., Tr 1 turns off and C2 charges through R3. C1 discharges through R2 until 'b' reaches a point where Tr1 turns on, (end of front porch). 'c' goes to 0 v. drives 'd' to -5.4 v. and turns Tr2 off. 'e' goes to +0.6 v., Tr3 turns on and 'f' goes to 0 v., (start of line sync pulse). C2 discharges through R4 until 'd' reaches a point where Tr2 turns on, (end of line sync pulse). 'e' goes to 0v. Tr3 turns off, 'f' goes to +6 v. At the end of the input pulse 'a' goes to +6 v., C1 charges through R1.

The circuit, with different component values would also be suitable for producing the delay and duration of a line clamp pulse or colour-burst gate pulse.



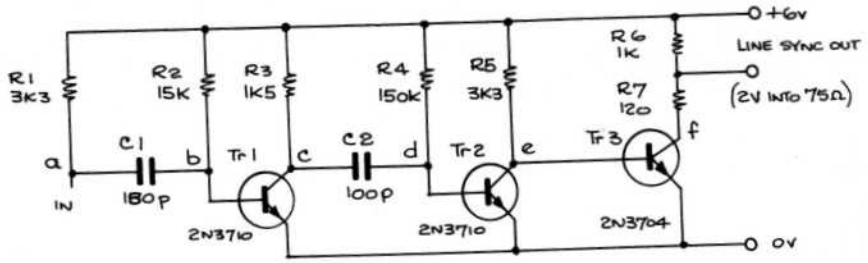

+6v
LINE SYNC OUT
(2V INTO 75Ω)
R1 3K3
R2 15K
R3 1K5
R4 150K
R5 3K3
R6 1K
R7 120
C1 180p
C2 100p
Tr1
Tr2
Tr3
2N3710
2N3710
2N3704
IN
0v
a
b
c
d
e
f

FIG 2.

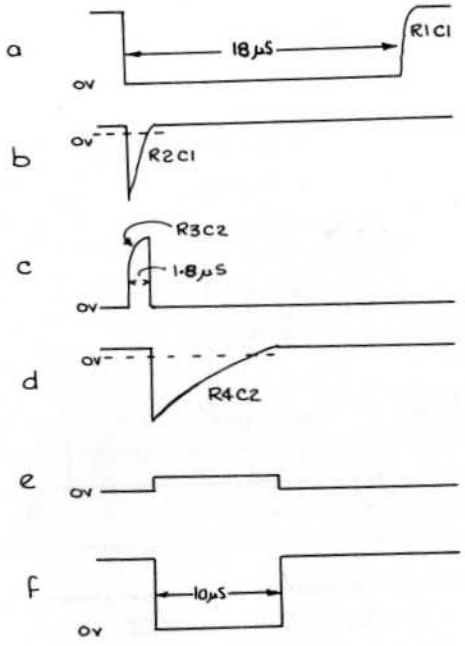

a
18μS
R1C1
0v
b
0v
R2C1
c
R3C2
1·8μS
0v
d
0v
R4C2
e
0v
f
10μS
0v

FIG 3.

A Bistable Beam Shifter

When checking amateur T.V. sync pulse generators it is sometimes necessary to examine, with an oscilloscope, the field sync signal on odd and even fields. This can be done using a single beam oscilloscope having triggered sync and the beam shifter device to be described.

The complete circuit and method of connection is shown in Fig. 1. A bistable circuit is triggered from the field drive signal so that the output from one side of the bistable is a square wave having the duration of each state equal to one field scan period, the change-over taking place coincident with the leading edge of the field drive signal.

The resultant 25 Hz square wave signal is mixed with the input video signal in a simple resistor network, R2, R3, and RV1, so that the video signals of alternate fields are superimposed on alternate half cycles of the square wave signal.

The oscilloscope is set so that the time-base is triggered by every field drive pulse. This produces a display in which alternate field signals appear separated in the vertical direction. A typical display is shown in Fig. 2.

For simplicity, an integrated circuit, Motorola type MC726P, is used for the bistable. The connections for this are shown in Fig. 1. It would be quite satisfactory to use a bistable built from discrete components if these are more readily available.

A further use for the beam shifter is in monitoring the video signals in a field sequential colour system. In this arrangement a ring-of-three counter is used to provide different amounts of shift on each field and the video signals are displayed sequentially on the oscilloscope, one above the other. The circuit and typical waveforms are shown in Fig. 3.

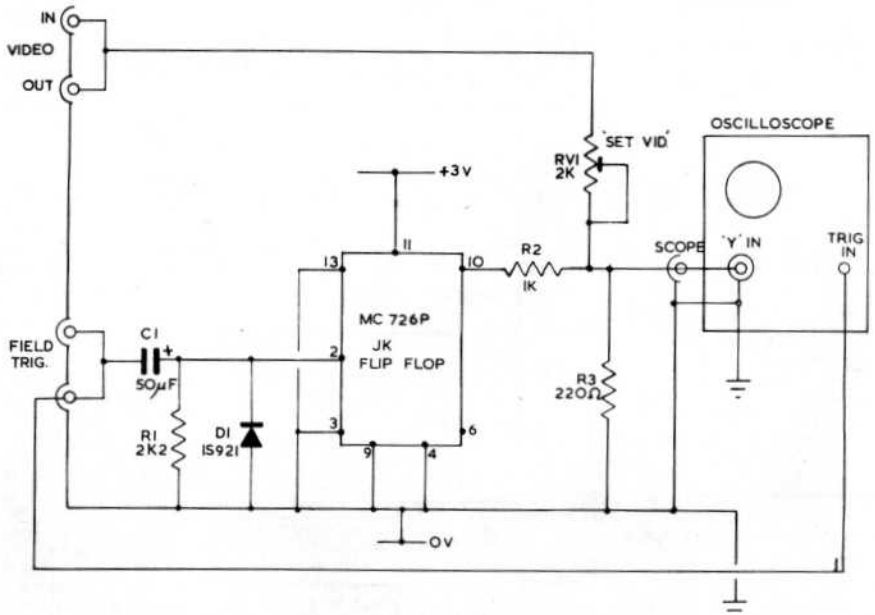
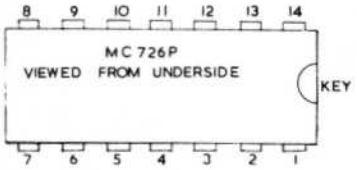


FIG. 1. BISTABLE BEAM SHIFTER



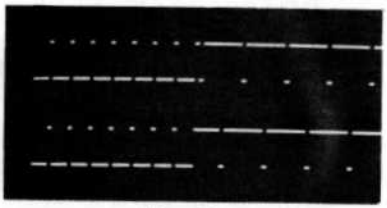
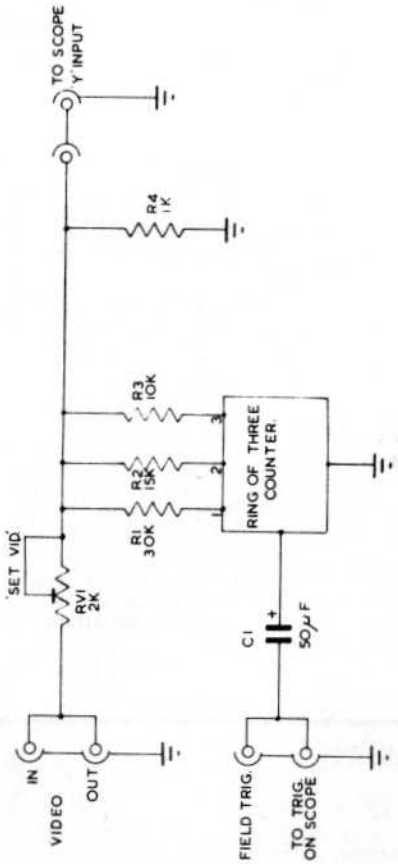


Fig. 2



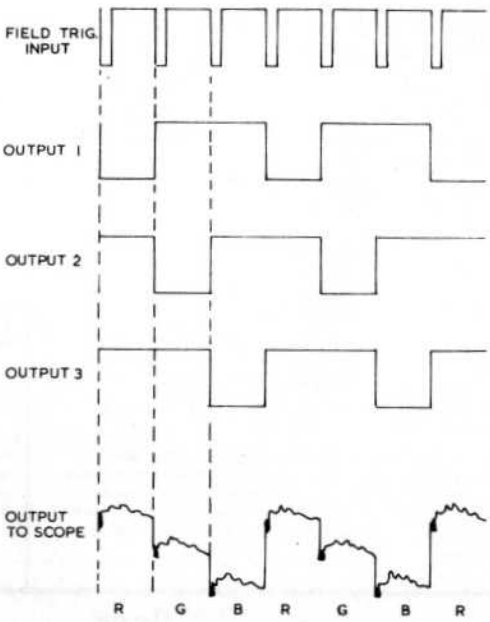


FIG. 3. RING OF THREE BEAM SHIFTER

slow scan news

It seems surprising that Slow Scan television has not caught on in this country at all. British Amateurs have not been attracted by this mode of communication and those people who are working with slow scan are not, generally speaking, licensed for the H.F. bands. This is a pity because there is a growing interest in slow scan in the U.S.A. and amateurs over there are now looking for transatlantic contracts. It seems as if the sheer weight of numbers will have forced British amateurs to adopt the American standards, or at least standards which are compatible with the American system. The following standards, reprinted from Q.S.T. Jan 1961 were suggested by Cop. Macdonald.

	U.S.A.	Britain
	60 cycle mains	50 cycle mains
Frame	8 secs	7.2 seconds
Line rate	15 cycles/sec i.e. 60/4	16⅔ c/s i.e. 50/3
No. of lines	120	120
Aspect Ratio	1:1	1:1
Scanning	Top to bottom and left to right	
Line Sync.	5 m sec	5 m sec
Frame Sync.	30 m sec	30 m sec

Subcarrier Frequencies

Sync.	1200 c/s	1200 c/s
Black	1500 c/s	1500 c/s
White	2300 c/s	2300 c/s
Transmission bandwidth	1 to 2.5 Kc/s	1 to 2.5 Kc/s

It is strongly recommended that anyone building slow scan cameras or monitors should adhere to these standards in the future so that there may be the maximum possible interchange of pictures both over the air and on tape.

The latest news from the U.S.A., via Aubrey Black and Henry Chenery, is that Ralph Taggart and Ted Cohen have both been doing experiments on the transmission of colour pictures using a frame sequential slow scan technique. A Polaroid colour picture received from Ralph Taggart shows a reasonably successful picture with a slight overemphasis of the red. Experience will doubtless enable better results to be obtained, but both Ralph and Ted are to be heartily congratulated on the results so far obtained in this difficult aspect of picture transmission. Aubrey Black reports that Ralph used a frame sequential technique with colour filters to get colour separation pictures. These were then added to give the final Polaroid picture. Ted, working entirely independently, achieved some results with a different subtractive process about five days before Ralph.

These colour pictures are not, in the strict sense, Television pictures in that they cannot be seen in colour until reconstituted photographically. A normal slow scan picture using an afterglow screen does give an instantaneous view of a stationary object - such as the interior of the amateurs "shack" - and this immediacy is what has attracted many to slow scan T.V. The F.C.C. in U.S.A. now allow slow scan to be transmitted on the H.F. bands but our own G.P.O. have not, so far, been requested to permit this. Slow scan in this country has, so far, been treated like normal T.V. and restricted to the 70 cm band.

So now it is up to you! If a sufficient number of people get working on this interesting aspect of amateur T.V. it will be possible to persuade the G.P.O. to grant us the facilities already enjoyed in the U.S.A.

Book Review

WEATHER SATELITES

An excellent book on the subject of weather satelite receiving equipment titled 'Constructing Inexpensive Automatic Picture Transmission Ground Stations' has been brought to our notice by Mr. Beesley of Weybridge. Distributed by Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, U.S.A., is a small item of the vast output of NASA.

It is available from Dillons University Bookshop Limited, 1 Malet Street, London, W.C. 1, on their reference TB/VBV at 10/- plus 1/- postage.

The book covers all aspects of reception from construction to specialized oscilloscope circuitry amounting to fifty pages of interesting reading.

A BEGINNERS GUIDE TO INTEGRATED CIRCUITS

by G. Sharpley.

I shall confine myself in this article to logic circuitry r for us, pulse circuits. IC's lend themselves very well to pulse generation.

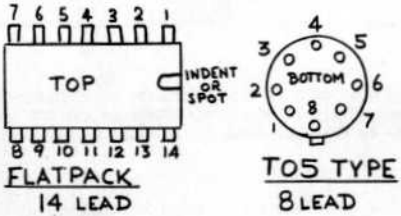
The popular IC's, or should we say the ones we are likely to get hold of, are usually in one of two packages. The flat pack, with fourteen connectors, or the 8 lead TO5 type. There are of course many other types of package.

GATES

Many IC's contain gates, some containing four or more separate gates. There are many different types of gate. Let us look at some in terms of pulses although it must be remembered that they will work with DC levels also. Let's call the levels 0 and 1. 0 is nearly Zero volts and 1 is NEAR the supply voltage.

POWER SUPPLY

IC's usually work from fairly low +ve supply rails 3.5v and 5v being typical. The supplies are connected across two of the IC leads. No external resistors or capacitors are required to connect IC's together in most cases. It is as well to decouple the supplies with a 0.1 mf capacitor near each IC to prevent stray pulses on the power supply triggering the circuitry.

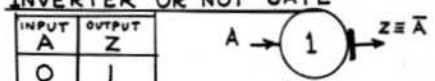


TWO PACKAGE TYPES

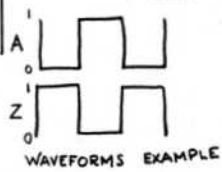
INVERTER OR NOT GATE

INPUT A	OUTPUT Z
0	1
1	0

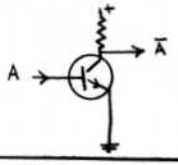
TRUTH TABLE



$\bar{A}$ MEANS 'NOT A'



THIS COULD BE JUST A SINGLE NPN TRANSISTOR

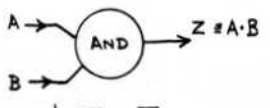


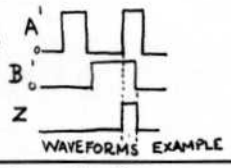
AND GATE

INPUTS A AND B MUST BOTH BE AT '1' FOR OUTPUT TO BE AT '1'.

A	B	Z=A·B
0	0	0
0	1	0
1	0	0
1	1	1

A·B MEANS A AND B



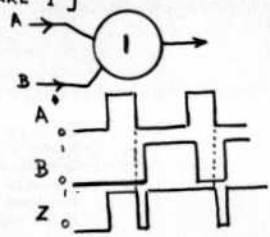


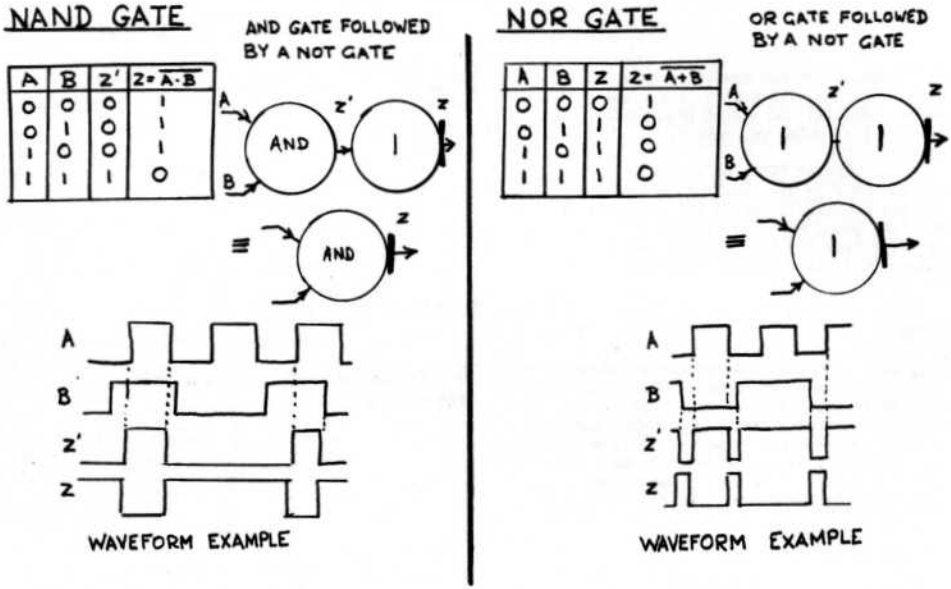
OR GATE

INPUTS A OR B MUST BE AT '1' FOR OUTPUT OF '1'

[THIS SHOULD REALLY BE CALLED AN 'INCLUSIVE OR' GATE SINCE IT INCLUDES THE OCCURRENCE OF '1' AT OUTPUT WHEN BOTH A AND B ARE '1']

A	B	Z=A+B
0	0	0
0	1	1
1	0	1
1	1	1





By study of the waveform examples given with these various types of gate, it can be seen that most of the functions required in generating complicated pulse trains such as mixed syncs and blanking etc., in SPG's, can be performed. I have detailed only gates with two inputs, but gates with five or more inputs are available. Remember that only a piece of wire is required to connect the output of one gate to the input of another. Even cheap integrated circuits will work at speeds greater than 5MHz. Integrated circuit packages can contain more than one element. For example, the Mullard FJH 131 contains four separate 2 input NAND gates and the FJJ 191 two separate flip-flops. I shall consider flip-flops and counter circuits in my next article.

NEWSREEL

Our friend and life member, Mr C Grant Dixon, well known for his work on slow-scan, radiated live pictures on 405 lines on the 70cm band for the first time on 25th October. His call sign is G6AEC/T and his QTH is near Ross-on-Wye. His first pictures were just about receivable by Malcolm, G6KQJ/T, at Penn, Wolverhampton.

The IARU conference in Brussels decided to implement the following decisions which are both in agreement with the BATC committee's recommendations:

(a) "The CCIR System following the Gerber standard (625 lines, 50 fields) should be adopted as the international amateur TV standard."

(b) "That the 70cm Band Plan be amended to place the upper limit on the communication band as 433.5MHz leaving the band 433.5 to 434MHz either for TV sound channels or as a guard for television. The whole of the band from 433.5MHz to the top of the allocation to be for TV."

A.T.V. Lecture at Bangor University

On 10th October, 1968, John Lawrence GW6JGA/T gave a lecture to the University College of North Wales Amateur Radio Society on Amateur Television. This included demonstrations of amateur monochrome and colour equipment. Over 120 attended the meeting.

Live pictures were transmitted from the U.C.N.W.A.R.S. ham shack in the main College Building, across town, to the lecture theatre in the Engineering Science building. Those attending the lecture were able to see around the shack and watch the Club Station GW3UCB in operation. Dr David Last GW3MZY acted as commentator at GW3UCB and gave details of U.C.N.W.A.R.S. activities, answering questions relayed from the lecture theatre by Bob Thornton GW3WKM on 4m. The cameraman was John Levett GW3VYL and the main operator of GW3UCB was Andy Durbin GW3WYC. In spite of four bands being used simultaneously there were no QRM problems. Details of the links are shown in the diagram.

OFF AIR PICTURES FROM GW6JGA/T

THE BRITISH AMATEUR TELEVISION CLUB